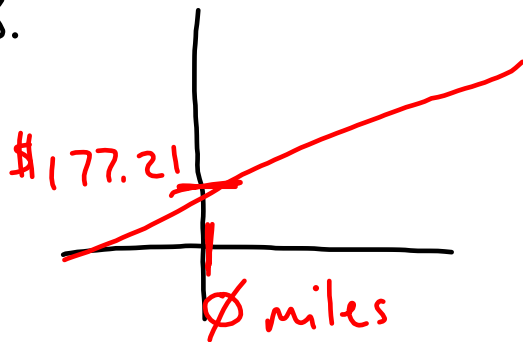


Worksheet 8-13 continued:

3.



To go 0 miles, you pay \$177.21.

└──────────┘
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x-variable
y-variable

4. $b = 0.078$ \$/mile

- It costs \$0.078 to go each mile.

- Our model predicts that each mile will cost \$0.078.

5. $\hat{y} = a + bx$

$$\hat{\text{fare}} = \$177.21 + (0.078 \text{ \$/mile})(\text{distance})$$

$$\begin{aligned} 6. \text{ Residual} &= y - \hat{y} \\ &= \text{given fare} - \hat{\text{fare}} \\ &= \$212 - \$311.29 \\ &= -\$99.29 \end{aligned}$$

$$\begin{aligned} \hat{\text{fare}}(1719) &= \$177.21 + (\$0.078/\text{mi})(1719 \text{ mi}) \\ &= \$311.29 \end{aligned}$$

$$\begin{aligned} 7. \hat{\text{fare}}(200) &= \$177.21 + (0.078 \$/\text{mi})(200 \text{ mi}) \\ &= \$192.81 \end{aligned}$$

8. In general, a positive residual means... that the actual value is greater than the expected value.

9.

$$\begin{aligned}\widehat{\text{fare}}(2000) &= \$177.21 + (0.078\$/\text{mi})(2000\text{ mi}) \\ &= \$333.21\end{aligned}$$

10. In general, a negative residual means that... actual value is less than predicted value.

Test Topics:

- Scatterplots
 - Form
 - Direction
 - Strength
- Correlation
 - Use calculator
- Linear Regression
 - Linear model
 - variables
 - y-intercept
 - slope
 - Use calculator
- Residuals
 - Calculate
 - Context

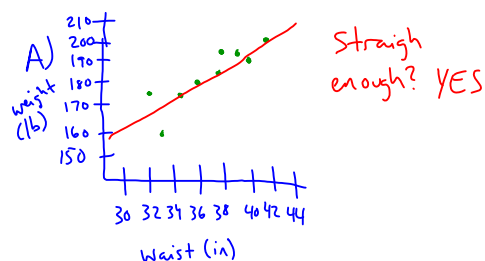
Waist (in): 32, 36, 38, 33, 39, 40, 42, 35, 38

Weight (lb): 175, 181, 200, 159, 196, 194, 205, 173, 187

A) Scatterplot \rightarrow straight enough?

B) Correlation \rightarrow Form, direction, strength

C) Linear model \rightarrow write equation, explain slope and y-intercept in context



B) Correlation (r) = ± 0.893

Direction \rightarrow positive

Form \rightarrow Linear

Strength \rightarrow strong

C) $\hat{y} = a + bx$

$$\widehat{\text{Weight}} = 35.83 \text{ lb} + (4.05 \text{ lb/in})(\text{waist})$$

Slope in context:

For every inch of waist increase, the man will be 4.05 pounds heavier.

y-intercept in context:

If a man had a waist of 0 inches, he would weigh 35.83 lbs.

D) Residual of 32 inches of waist size:

$$\begin{aligned}\widehat{\text{weight}}(32) &= 35.83 \text{ lb} + (4.05 \text{ lb/in})(32 \text{ in}) \\ &= 165.4 \text{ lb}\end{aligned}$$

$$\begin{aligned}\text{Residual} &= y - \hat{y} \\ &= \text{actual weight} - \widehat{\text{weight}} \\ &= 175 \text{ lb} - 165.4 \text{ lb} \\ &= 9.6 \text{ lb}\end{aligned}$$

This man weighs 9.6 lbs greater than the predicted value.